

**We claim:**

1. An isolated nucleic acid molecule comprising a nucleotide sequence encoding a T-bet protein.
2. The nucleic acid molecule of claim 1, which comprises the nucleotide sequence shown in SEQ ID NO:1.
3. The nucleic acid molecule of claim 2, which comprises the nucleotide sequence of SEQ ID NO: 3.
4. The nucleic acid molecule of claim 1, which has at least 70% nucleotide identity with at least about 700 contiguous nucleotides of SEQ ID NO:1.
5. The nucleic acid molecule of claim 1, which has at least 70% nucleotide identity with at least about 500 contiguous nucleotides of SEQ ID NO:3.
6. The nucleic acid molecule of claim 1, which has at least 90% nucleotide identity with at least about 700 contiguous nucleotides of SEQ ID NO:1.
7. The nucleic acid molecule of claim 1, which has at least 90% nucleotide identity with at least about 500 contiguous nucleotides of SEQ ID NO:3.
8. A vector comprising the nucleic acid molecule of claim 1.
9. The vector of claim 8, which is an expression vector.
10. A host cell containing the vector of claim 9.
11. A method for producing a T-bet protein comprising culturing the host cell of claim 10 in a suitable medium until a T-bet protein is produced.
12. The method of claim 11, further comprising isolating the T-bet protein from the medium or the host cell.
13. An isolated T-bet protein.

- 90 -

14. The protein of claim 12, which comprises the amino acid sequence encoded by the nucleic acid sequence of SEQ ID NO:1.

15. The protein of claim 12, which comprises the amino acid sequence  
5 encoded by the nucleic acid sequence of SEQ ID NO:3.

16. The protein of claim 12, which comprises the amino acid sequence of SEQ ID NO: 2.

10 17. The protein of claim 12, which comprises the amino acid sequence of SEQ ID NO: 4.

15 18. The protein of claim 12, which has at least 70% amino acid identity with the protein shown in SEQ ID NO:2.

19. The protein of claim 12, which has at least 70% amino acid identity with the protein shown in SEQ ID NO:4.

20 20. The protein of claim 12, which has at least 90% amino acid identity with the protein shown in SEQ ID NO:2 and having the ability to bind to DNA.

21. A fusion protein comprising a T-bet protein operatively linked to a polypeptide other than T-bet.

25 22. Antibodies that specifically bind T-bet protein.

23. The antibodies of claim 21, which are polyclonal antibodies.

24. The antibodies of claim 21, which are monoclonal antibodies.  
30

25. The antibodies of claim 21, which are coupled to a detectable substance.

26. A nonhuman transgenic animal that contains cells carrying a transgene encoding a T-bet protein.  
35

27. A method for detecting the presence of T-bet in a biological sample comprising contacting the biological sample with an agent capable of detecting an

- 91 -

indicator of T-bet activity such that the presence of T-bet is detected in the biological sample.

28. A method for modulating T-bet activity in a cell comprising contacting  
5 the cell with an agent that modulates T-bet activity such that T-bet activity in the cell is modulated.

29. A method for identifying a compound that modulates the activity of a T-bet protein, comprising  
10 providing an indicator composition that comprises a T-bet protein;  
contacting the indicator composition with a test compound; and  
determining the effect of the test compound on the activity of the T-bet protein in the indicator composition to thereby identify a compound that modulates the activity of a T-bet protein.

15 30. The method of claim 29, wherein:  
the indicator composition comprises a T-bet protein and a DNA molecule to which the T-bet protein binds; and  
the effect of the test compound on the activity of the T-bet protein is determined  
20 by evaluating the binding of the T-bet protein to the DNA molecule in the presence and absence of the test compound.

31. The method of claim 29, wherein:  
the indicator composition is a cell comprising a T-bet protein and a reporter gene  
25 responsive to the T-bet protein; and  
the effect of the test compound on the activity of the T-bet protein is determined by evaluating the expression of the reporter gene in the presence and absence of the test compound.

30 32. The method of claim 29, further comprising determining the effect of the test compound on an immune response to thereby identify a compound that modulates an immune response.

33. The method of claim 28 or 29, wherein the activity of T-bet is enhanced.

35 34. The method of claim 28 or 29, wherein the activity of T-bet is inhibited.

- 92 -

35. The method of claim 28 or 29, wherein the activity of T-bet is IFN- $\gamma$  production.

36. The method of claim 28 or 29, wherein the activity of T-bet is transcription of IgG2a.

37. The method of claim 28 or 29, wherein the step of contacting occurs *in vivo*.

38. The method of claim 28 or 29, wherein the step of contacting occurs *in vitro*.

39. The method of claim 28 or 29, wherein the test compound is selected from the group comprised of: a T-bet nucleic acid molecule, a T-bet peptide, a small molecule T-bet agonist and a small molecule T-bet antagonist.

40. The method of claim 28 or 29, wherein the test compound is selected from a group comprised of: an intracellular antibody, a nucleic acid molecule that is antisense to a T-bet molecule, a dominant negative T-bet molecule, a small molecule T-bet agonist and a small molecule T-bet antagonist.

41. The method of claim 28, wherein the cell is selected from the group consisting of: a T cell, a B cell, and a macrophage.

42. The method of claim 41, wherein the cell is a Th1 cell.

43. A method of diagnosing a subject for a disorder associated with aberrant immune cell activation comprising:

- (a) detecting expression of T-bet in immune cells of a subject suspected of having said disorder;
- (b) comparing expression of T-bet in immune cells of said subject to a control that is not associated with aberrant immune cell activation; and
- (c) diagnosing the subject for a disorder based on a change in expression of T-bet in immune cells of the subject as compared to the control.

44. The method of claim 43, wherein the disorder is an autoimmune disease.

45. The method of claim 44, wherein the disorder is lupus.
46. The method of claim 43, wherein the disorder is Inflammatory Bowel Disease.
47. The method of claim 46, wherein the disorder is Crohn's disease.
48. The method of claim 46, wherein the disorder is ulcerative colitis.
49. The method of claim 46, wherein the disorder is asthma.

5

10

[illegible]